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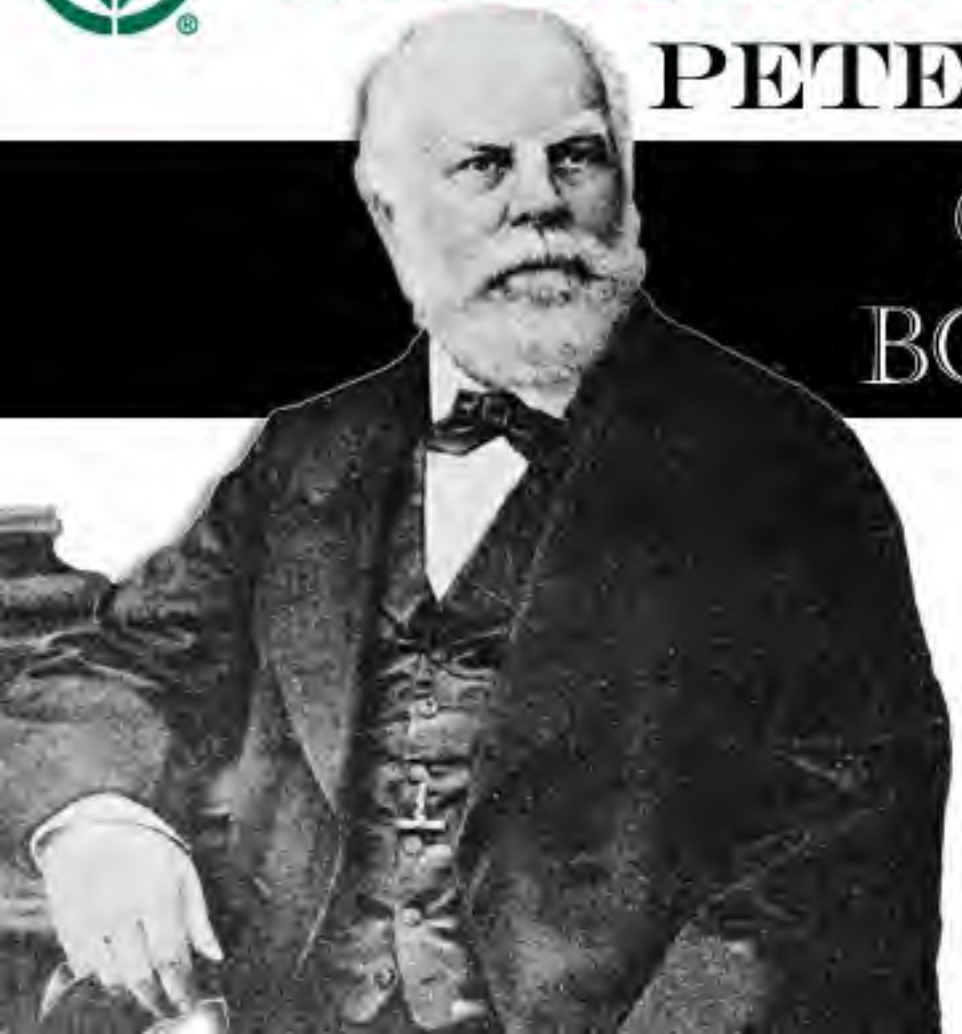
George Engelmann Botanical Notebooks



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A Braun has growing
Febr 1867

Isoetes Engelmanni

I. melanopoda

~~I. Braunii~~

I. Tuckermanii

13945

Office German Mutual Life Insurance Co.

OF ST. LOUIS,

No. 112 Market Street, between Main and Second,

0 1 2 3 4 5 6 7 8 9 10
cm
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	diamet of macrosp. mm.	of microsp.
Cagelmanni	0.40 – 0.52 ; 45	0.025 – 0.029
valida	0.32 – 0.47 ; 40	0.024 – 0.027
riparia	0.45 – 0.65 ; 55	0.027 – 0.032
muricata	0.45 – 0.58 ; 50	0.028 – 0.032
var	0.37 – 0.47 ; 45	0.029 – 0.032
Bruunii	0.42 – 0.57 ; 45	0.025 – 0.032
echinospora	0.42 – 0.50 ; 45	0.031 – 0.034
Saikaensis	0.41 – 0.47 ; 45	0.025 – 0.026
Carolina Annia	0.69 – 0.80 ; 75	0.039 – 0.043
	0.67 – 0.81	0.034 – 0.038
malacospora	0.56 – 0.65 ; 60	0.039 – 0.041
Gerospora	0.30 – 0.38 ; 35	0.023 – 0.027
Melanopoda		
Tuckermani	0.44 – 0.58 ; 50	0.028 – 0.032
Mühlenbergii		
marina	0.25 – 0.37 ; 32	
Chapmanii	0.43 – 0.52 ; 47	0.026 – 0.030
Carolina decidata		
heterospora		
Californica	0.33 – 0.46 ; 40	0.025 – 0.031
Flavida	0.34 – 0.42 ; 38	
fide Braun		
Arbuscula	0.30 – 0.42 ; 36	0.028 – 0.031
Carpetbl	0.30	
Smallest	0.98	

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J. McKittrick & Co. 36 N. Main St.

13946

Isoetes Asturica var Sardoa

A Braun Sert. 1864

562 I. Engelmanni number of leaves sometimes over 100
fide Dr Gerbel.

567 Velum narrow, surrounding the Opening of the fovea
with a narrow falciform process.

582 Leaves each a length of 30 centimetres,

593 Macrospores with ~~Reg~~ular reticulations, honeycomblike

594 microspores among the smallest, 0,025 m.m long

595 short-spinulose.

13947

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A Braun - Catt April 19 1867

1. I. Lacustris Lin var macrospora

? 2. I. Canadensis Braun (lacustris - riparia ? by incomplete sporiums from Watt) X

3. I. riparia Cogdon.

4. I. Tuckermani Braun

5. I. ambigua Braun (I. Braunii Dur)

6. I. Bootti Braun (I. mutata var Bootti ?

7 I. mutata Dur (unites riparia with ambigua)

8 I. saccharata Lagerh

? 9 I. pauperula Braun. Lehigh Aver Dana X

10 I. Lagerheimii Braun con. valida, fasciata etc

11 I. melanopoda Gay

12 I. flaccida Shuttlew.

13 I. Chapmanii Flaccida & Lagerh. } ns

14 I. Nuttallii Braun

15 I. pygmaea Br. & Engl } ns

16 I. Boldenii Lagerh }

Thesp: Lacustris
riparia
Tuckermani
ochrospora var
saccharata
Lagerheimi
melanopoda
flaccida & Chap
Nuttallii
Californica Boldeni
pygmaea

ovv

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Einziehung von Erbschaften,
Beförderung von Packeten,
Schiffs-Kontrakte,
Wechsel- und Geld-Auszahlungen,
Eisenbahn-Billets.

Europäische General-Agentur

von

Rudolph Mackwitz,

Saint Louis, May 11 1867

Herrn Dr George Engelmann

St Louis Mo

Hierdurch Quittung über Ihren mir heut für die mir Packet aus Breslau bei mir angekommen ist, welches die gefällige gegen Zahlung von 40 cts Porto & Verzollungsspesen mir Quittung bei mir in Empfang nehmen wollen

Mit achtung Ergebenst

Rmackwitz

13948

Isoetes for Greenhill Manuel
Feb 1867

	macrosp lin	microsp lin
* Subinermae		
1. lacustris		
var macrospora	0.32–0.38	0.017–0.020
2. Tuckermani	0.22–0.28	0.013–0.015
3. echinospora	0.20–0.24	0.015–0.016
Braunii	0.20–0.24	0.013–0.014
muricata	0.22–0.27	0.013–0.015
* Amphibiae		
4. saccharata	0.20–0.22	0.012–0.013
5. riparia	0.22–0.30	0013–0.016
6. Engelmanni	0.19–0.24	0.012–0.014
gracilis	0.18–0.23	0.012–0.013
valida	0.16–0.22	0.011–0.013
7. melanopoda	0.14–0.18	0.010–0.012

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13949

Dr. Geo. Engelmann

Cer. Subj. Elm. etc

Uxbridge Insects rec. Dec 28. 1866

	macrospores	microspores	
No. 1	0.60 – 0.71	Uxbridge 0.045 – 0.048	Lacust
2	Brunn"	Uxbridge	
3	0.59 – 070	Uxbridge	Lacust
4	Brunn"	near Blackstone River	
5	Brunn"	Grafton	
6	Brunn"	Uxbridge	
7	0.44 – 052	" 0.029 – 0.031	rufus
8	0.53 – 0.65	" 0.031 – 0.036	nig
9	0.47 – 0.55	" 0.029 – 0.033	rubicund
10	0.53 – 0.65	Uxbridge 0.029 – 0.032	nig
11	0.46 – 0.54	0.028 – 0.031	rubicund
13	0.41 – 0.45	Colebrooks CT 0.023 – 0.024	Lanuginosus var gracilis
14	0.44 – 0.55	Uxbridge, Millpond	nig

(1 = 14) Lac
3 = 14
7 = 13 Lug.
9 = 11 Lug?
10 nig. with Lug leaves = Lug ? Gray
8 ≈ 14 Nig?

(2 = 4
5
6) over Brn

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JONES & SIBLEY,

DRUGGISTS,

Cor. 5th Market Sts,

ST. LOUIS, MO.

℞

1.3 Lanatus

2.4.5-6. Arnicae

7 8 9 11 14 Tinct.

10 — — — mayr

13 Capsulae

12 Millepedis Alb.

Aq. ibi Bss

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Rabites arranged according to size

of macrospores		of microspores	
melanopoda	30–38 / 35	melanopoda	23–27 / 25
floridana	34–42 / 38	saccharata	25–26 / 25
valida	35–45 / 40	valida	25–27 / 26
Engelmanni	40–50 / 45	Engelmanni	24–29 / 26
saccharata	41–47 / 45	Braunii	25–31 / 28
Braunii	42–52 / 45	Tuckeri	25–32
echinospora	42–50 / 45	riparia	28–32 / 30
muricata	45–55 / 50	muricata	27–32 / 30
Tuckeri	46–56	echinospora	31–34 / 32
riparia	45–65 / 55	Lecontei	39–41 / 40
Lecontei	55–65 / 60	macrospora	39–43 / 42
macrospora	70–80 / 75		

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Alex. Leitch,

APOTHECARY & CHEMIST,

Cor. 4th & Olive Sts., St. Louis.

13951

First Discovery of the Species of Isoetes in N. America
or rediscovery after having been forgotten, and history of detail thereof

1805?	J. Dahl	Isoetes echinospora var.	Greenland	(Hb. G.E.)
1812?	T. Pursh	I. echinospora var?	Oswego River	West N York
1815.	Th. Nuttall	I. riparia	Banks of the Delaware near	Philadelphia (Hb Acad Phil.
1820?	L. v. Schweinitz	I. Canadensis	Catskill Mts, N.Y.	Hb Acad Phil.
1831	J. W. Robbins (Mr. Hitz)	I. riparia	Uxbridge Mass	(Hb. Eng.)
1832.	C. J. Moser	I. Engelmanni	in the Lehigh R. near	Bethlehem Pa (Hb. Hort Bot Monspin olim Bernhardi)
		I. riparia	in some Europ. Herb.	
1834	Th. Nuttall	I. Nuttallii	Oregon	(Herb Acad Phila ~~Just from Impss~~
1840	J. W. Robbins	I. Lacustris	Uxbridge. Mass.	Hb Engl
1842?	Dr Rugel	I. floridana	Lake Demonia	Florida Hb A Braun &c
1842	G. Engelmann	I. Engelmanni	Missouri	Hb Engl &c
1843	Ch Geyer	I. Nuttallii	Illinois	Hb Kew
1843	E. Tuckerman	I. Lacustris	Echo Lake, New Hampshire	
1844	Wm Zantzinger	I. riparia	Philadelphia	Hb. Engl
1845	J. W. Robbins	I. echinospora var Braunii	Mass	Hb Engl
1848	E. Tuckerman	I. Tuckermanii	Massachusetts	Hb A Braun
1850	A. W. Chapman	I. floridana var Chapmanii	Florida	Hb. Engl
1853	E. Hall	I. melanopoda	Illinois (making bricks)	Hb Hall, Engl
1856	G. Englm	I. echinospora var Braunii	New Hampshire	Hb Engl
1857	E. D. Eaton	I. Engelmanni var gracilis	Connecticut	Hb Engl
1860	Wm Boott	I. echinospora var muricata	Mass	Hb. Engl
1862	H. C. Potter	I. Engelmanni var valida	Pennsylvania	Hb Engl
1862	G. Vasey	I. melanopoda	Iowa	
1863.	J. Macoun	I. echinospora Braunii	West Canada	Hb. Engl
1863.	Wm M. Canby	I. saccharata	Maryland	Hb Engl
1864	J. W. Robbins	I. riparia	Massachusetts	Hb Engl
"	J. Macoun	I. riparia	Canada West	Hb Engl
1865	Leidy & Porter	I. Lacustris	Lake Superior	Hb Engl
"	Wm Boott.	I. Tuckermanii	Massachusetts	Hb Engl
1866	Ch. Wright	I. Cubana	Cuba	Hb Engl
"	H. Bolander	I. pygmaea	Calif	Hb E
"	H. Bolander	I. Bolanderi	Calif	Hb E
1867	Wm Boott	I. echinospora var Boottii	Mass.	Hb E
1869	S. Watson	I. echinospora var Braunii	Utah	Hb E
"	Wm Canby	I. melanospora	Georgia	Hb E

0 1 2 3 4 5 6 7 8 9 10
cm
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† some species have regularly 2 and 3 leaves together (P. mitis, P. Elliottii), others vary with 2 to 5 leaves (P. Montezumae), ~~and frequently~~ ~~3~~ species with 3 leaves have occasionally 2 or 4, such with 5 leaves are sometimes found with 6 and even 7 leaves.

13952

They are also found on the sprouts. They are always subulate from a broader base, ~~flat~~, keeled on both surfaces, always serrulate, even in those species, ~~that~~ whose secondary leaves are entire (P. edulis), with stomata (on both surfaces in rows), more on the lower than upper face.

The primary leaves not rarely produce in their axils buds with ~~which bear~~ secondary leaves, but they are most generally reduced to bracts (Hochblaetter) before their axils become productive. These bracts are (membranaceous or ~~rarely~~ coriaceous) triangular - lanceolate entire or mostly fringed on the edges, more or less persistent or mostly deciduous, sometimes articulated above their base.

The secondary leaves ~~form~~ constitute the foliage of the tree. They are born on an undeveloped branchlet in the axils of primary leaves or mostly of bracts and are surrounded at base by sheath of budscales (Nieder blaetter). These consist of 2 short, rigid strongly keeled lateral bracts and a number (6-10 or more) longer, thinner inner ones, which generally are woven together by the delicate fringes of their edges, and are then persistent with the leaves, though in time worn off at the ends; or they are loose, at last spreading and deciduous at the end of the first season. This is the case in all the species of the section Strobus, in the Nutpines, and in a few others, P. Balfouriana, Jeffreyana, Bungeana, Chihuahuana and usually also in P. leiophylla.

The secondary leaves ~~themselves~~ generally occur in definite numbers, 1 to 5, in a bunch or their number is slightly variable. Where we have only one (only in P. monophylla) the leaf is terete; where there are two, the leaves are semiterete, convex on the lower surface ~~convex~~, ~~on the upper~~ and flat on the upper one when fresh, or channeled when dry. Those leaves that grow in bundles of 3 or more are triangular, the upper surface being (elevated more or less) and keeled. (12) Ternate leaves are generally somewhat slender and quinate ones higher and more strictly triangular, ~~that~~ Thus the shape of the leaf, and especially its transverse section is mostly sufficient to determine the number in which they occur.

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2 Isoetes

I. Engelmanni grandis

" alba

" superba

Georgiana

I. melanopoda Gay

I. Butleri Engl

I. Nuttallii

New England Robbins 1864

Philadelphia, Mr. Eaton 1857

Delaware Canby 1866

Prof. Porter 1862

A. Commons 1866

Georgia Chapman 1873

Ills. E. Hall 1862 ?

Maywood Vasey 1863

Iowa Clute Vasey 1862

Indiana Dennis J. S. Butler 1875

Texas E. Hall 1872

Ind. Territ. G. D Butler 1875

Oregon Nuttall 1834

Hall 1848

Idaho Cour d'Alene Geyer. 1861

25 small type

13953

of the Rocky Mountains

see Engelm. in

with shorter and often binate leaves and smaller cones. (Fl. Calif. 2. p. 125.)

23. P. Canariensis, Ch. Smith. is perhaps more nearly related to ~~may be considered a three leaved~~ P. Laricio ~~rather~~ than to P. ponderosa. The articulation of the involucral bract is a curious feature, which it has in common with our P. resinosa (see pag. —)

the mountains of

24. P. Chihuahuana, Engelm. first described from Chihuahua, but now repeatedly found in Arizona, is well distinguished from allies relatives by the deciduous sheaths.

25. P. Laricio, Poir. Strengthening cells around ducts and all around in bundles leaf in bundles; the typical form has slender leaves and is tender in cultivation, Var. Monspeliensis or Pyrenaica (not to be confounded with no. 15 as the author of that species himself and many later botanists have done) has slender leaves with scarcely any strengthening cells around the leaf and is more hardy than the species. Var. Austriaca or nigra is perfectly hardy, has the stoutest leaves of all the forms with strengthening cells abundant. A specimen in Herb. Kew, Birma, Griffith 4993, may belong here, thus extending the species far into Asia.

26 P. Thunbergii, Parlat. This is P. Massoniana Sieb. & Zucc. and of many authors and many Gardens, but is easily distinguished by its slender, shorter leaves with parenchymatous ducts. It seems peculiar to Japan, though cultivated in Australia, whence P. Australasiaca, Stead. an original specimen of which I have been able to examine in Herb. Cosson. Its parenchymatous ducts distinguish this species at once from any other Japanese pine and place it near P. Laricio.

Cosson

27 P. contorta, Dougl. is a little out of place here and evidently belongs nearer to the next group, but it has the subterminal cones of this. Like its American allies it is distitute of strengthening cells about the ducts, which character distinguishes it at once from its old-world ~~neighbors~~ associates, and so do the subulate points of the female scales. The low-growing narrow-leaved coast form, which is found along the Pacific coast from northern California to Alaska,

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Amerin Isoetes published

1751 Isoetes Carentei Lin. 175

1846 I. riparia Lay Eng Bran + Flora 1846 N: 12
" I. Engelmanni Bran " "
" I. flaccida Schuttleu . "
1861 I. echinospora Durieu (Europa) Bulled. B. 164 for Gb Fr.
1864 I. Braunii Dur. :6 p. 101 I. macrospora p 101
" I. muricata Dur :6 100 :6. 102
" I. melanospora Gay :6. 102

1868 I. echinospora Dur. var. Amerin. Braunii
Engelm Gray Man ed. 5 Isoetes 1868 p. 676

" I. Tuckermanni Braun Eng. :6. " "

" I. saccharata Eng. :6. " "

" I. Engelmanni Eng Braun Austral
mentioned but not by name Isoetes p. 524

1874 I. Bolanderi Eng. Am. Nat. 1874 vol 8 p.

" I. pygmaea Eng. " "

" I. Nuttallii Braun, Engelm &c.

1878 I. Butleri Eng. Bot Gazette Jan 1878

1877 I. melanospora Eng. Trans Acad. St Louis p. 395 note

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13954

Dr Engelman

I have been feeding the baby according to your directions & it seems to have had the effect of loosening her bowels & rather too much so, and I therefor write asking you what I shall do for her.

Most Respectfully
Mrs A. M. Meyer

May 3rd 1879
St Louis
Mo

0 1 2 3 4 5 6 7 8 9 10
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Trunc 2 parted very local except
leaves — stomata — Disagreements —
channeled — flat — variable —
3 angular.
Petiole
Cingula
cells of Sporangium

Macrospores Smooth Melanoid
Spinules
Microsp mainly saccharate
ridges
Coarsely macrosp rejoin
Tuberous.
Papillose reticulate
Cingulum, val. D.
Nuttallii ? flaccid ?

ENNO SANDER & CO,.

PHARMACEUTISTS,

Cor. 4th & Walnut, under Southern Hotel,
Cor. 2d & Walnut, under Barnum's Hotel,

ST. LOUIS, MO.

℞ Tart emetic gr ½
Aqua Dest 3ij
M ft S 6 mystures
ss

13455

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~~By Linnaeus and Coy after him~~ (Syst. Veget. ed. 1. 1753)
From the time of Linnaeus, ~~who established his single species~~ I. Cavanillesii
~~only~~ until 1843, for ~~about~~ 90 years, only 2 species were known
I. Cavanillesii Lin., I. Coromandelina Linn fil and I. asterea Bory
~~At the last mentioned year~~ Durieu de Maisonneuve (Bordeaux) ~~Bory~~ described
several new Algerian species, and these gave a new impulse to the
investigations of this interesting genus. ~~Alexander Braun published~~
In North America several species had been collected by Rush,
Nuttall, Schweinitz and others, but were considered identical
with the old Isoetes lacustris, till Alexander Braun published
in 1846 three new American ~~species~~ forms, ~~obtained~~ by Dr Engelmann
and Dr Lantzsperger, ~~and by~~

The publications of our species followed one another in the
following order

1846. I. Engelmanni, A Braun in Flora, March 31st, from Missouri, Engelm.
I. riparia, Engelm. ib. from Philadelphia
I. Flaccida Shuttleworth ib. from Florida, all three very nearly characterized
Lantzsperger
~~as published by~~.

1847 I. published translations in the Am. J. of Arts & Sci. N. Ser. III. 53.

(1861 Durieu de Maisonneuve distinguished (Charentais)
the two more common North European Isoetes as I. lacustris &
and I. echinospora Dur. Bull. Soc. Bot. Fr. VIII. 164) which had only
Then not been distinguished.

1864 Durieu de Maisonneuve in the same work, vol IX. ~~102~~ indicated 4 more
American Isoetes of which he I. muricata (p. 100) from Newfoundland, W. Booth
(p. 101) from Northumberland Co. Engelm. W. A. Braun
are in my estimation forms of his European I. echinospora, and
I. macrospora (p. 101) from the Catskill Mountains, Schweinitz which ~~in~~ can not be distinguished
from I. lacustris and I. melanopoda J. Gay (or as he writes it: Jay
& Durieu p. p. 102.) Illinois E. Hall.

1868 I published in the 5th ed. of Gray's Manual of the Northern States
p. 676 I. echinospora Dur var. Braunii (I. Braunii Dur.) & muricata (I. muric. Dur.) and Bootii
(I. Bootii, A Braun in lit.) from the northeastern States,
W Booth & others, I. Tuckermani A Braun in Lit. Massachusetts

0 1 2 3 4 5 6 7 8 9 10
cm
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13956

I have seen them 6, in *insignis* 5 and in *P. rigida* var. *serotina* 4 lines thick; in old age or in the short seasons of high altitudes it sometimes grows so slow that ten annual rings make not more than the thickness of one line.

The sapwood is always white and it takes many years before it turns into heartwood (perfect or ?), in *Lambertiana* and *mitis* sometimes 100 or even 150 years, in others, e.g. *P. flexilis*, *P. Sabiniana* not more than 20 or 30 years, but the majority of the pines which I have examined may require 50 or 60 years to mature their hardwood. In many other trees this process required about 20 or 30 years, in most oaks, on an average about 20 years, in *Catalpa* not more than 2 or 3 years. The thickness of the sapwood in Pines is usually 2-4 inches, and rarely under 1 inch; in *P. ponderosa* I have found it sometimes even 10 inches.

The wood cells and especially those more compact ones of the late summer growth, the outer part of the layers, are often strongly impregnated with resin, and thereby darker coloured yellowish or brown, and become in thin sections semi transparent; this is much more the case in those of the section *Pinaster* than of *Strobus*. The former have mostly heavier and harder wood than the latter, though we find exceptions, such as spirally marked cells, such as abound in *Pseudotsuga* and in *Taxus* have not been found in the pines.

The *leaves*, in the wider sense, are of seven different forms: the cotyledonous or seed-leaves, the primary leaves, the ordinary bracts, the secondary leaves, the bracts constituting their sheath, the bracts forming the involucrum of the male flowers, and the bracts supporting the carpellary scale.

The *cotyledonous leaves* form a whorl of 4 to 18 in number, are triangular, flat on the back, keeled above, higher than broad and mostly entire; in *P. Strobus* I find the keel slightly spinulose denticulate. Stomata are found only on the inner and upper sides.

The *primary leaves* succeed the cotyledons on the main axis in some species (*P. inops*, *P. rigida*, *P. Canariensis* etc.)

C. Tuckerm. and L. sarcharata Engl. Maryland Canby,
1874 I published in the Amer. Naturalist vol 8 p. 214. L. Boland on
Calif. Sierra, N. Boland, L. pygmaea, from the s— region and the
San Catalina, and p. 215. L. Nuttallii Watson in Brit Oregon Nuttall,
1877 L. Buttleri, from L. melanosporn Engl from
the Stone Mountain, Georgia, in the Trans. Acad Sci St Louis
3.395 in the Botanical Gazette for January p. 1
1878 L. Butleri, Eng. Indian Territory J. H. Butler

13957

The edges of the leaves are in most species minutely but sharply serrulate on the edges and mostly also on the keel of the upper surface. These serratures are closer together or more distant, coarser or more delicate, but are absent only in a very few west American species: the Cembroid or Nut pines, S. Balfouriana and ~~mostly~~ most forms of P. flexilis. The tips of the leaves are generally entire, acute or acuminate, rarely obtuse; but in all the species of the section Strobus they are finely denticulate ~~at least~~ in the young and fresh leaves.

The stomata are ~~p~~ usually distributed in longitudinal rows over both surfaces in the Pinaster section; only P. Balfouriana has none on the back, and these in this as in many other respects approaches the section Strobus. In ~~this section~~ Strobus we find no or ~~only~~ few stomata, sometimes a single or interrupted lines on the back. P. Lambertiana ~~has~~ only has numerous stomata on the back thus ~~in this respect~~ approaching Pinaster.

I will have to dwell somewhat extensively on the internal structure of the leaves, as it proves to be of the greatest importance for the classification of the species. We distinguish in a transverse section the epidermis (thick) and the chlorophyll-bearing parenchyma-cells and in the centre the fibro-vascular bundle. This latter is single in the terete and ~~Triangular leaves~~ or in other words in the single and in mostly in the quinate leaves, it is double in the broader Bingular, the ternate and in the semiterete or binate leaves. This difference, however, is of very little diagnostic importance, as ~~in a few species~~ we find occasionally single or double bundles in the same species. The fibro-vascular bundles always show wood cells on the upper or ventral, and bast cells on the lower or dorsal side, traversed by minute medullary rays usually diverging ~~running~~ obliquely from the lower to the upper side. The ~~woods~~ bundles are ~~surrou~~ imbedded in a mass of small (medullary?) cells, free of chlorophyll and ~~are~~ together with these and separated from the parenchyma surrounded by a sheath of larger cells, also ~~free of ch~~ destitute of chlorophyll.

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cm
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1816 Pursh — ? I. lacustris Brunswick

1818 Nuttall 9 — 9 — — — ripa[illegible] Kennebec Hallowell

1818 Barton — — — I. — — — " Callowhill

1833 Beck Bot. — I. — — — Pursh & Nuttall Cumberland

1840 Hook Fl. Bor. Am. — I — — — Saskatchewan Lake Winnipeg

1843 Torr Fl. NY. — I. — — — Pursh.

1844 Catesby Wilmot — I. — — — (Englem.

1846 Alton — Col Jour. Hort. N.S. N. 12 — I. Eaglesi Alton ripar Eaq. flavesc Shuttlew.

1847 Hopkinton — Silk Journ. n ser. III. 52 (Jan. 1847)

1848. Gray Man ed. 1. — I. lacust ripariae Englesm.

1856. Gr. Man ed. 2 Torrey

1853 Darlington ed 2 — I. lacustris most likely Englem.

1860 Chapman — — — I. flaviscens

1860 Tuttell Catal — I. riparia

I. Englemanni ? = Englem

1864 Darlington — I. muricata

I. macrospora.

I. Bracunii

I. melanocarpa

1864 Bot. Gaz. — Darlington specifically speaks of. I. Eaglesi

1850 Chapman — I. heterospora I. flaviscens

184

no Bot.

1802 Michaux

1824 Elliott

1826 Darlington ed. 1

1848 Asa Gray Jackson!

1856 Lacustris Eng 17 Sept Echoleke

1856 Bracunii Eng Wrapers Sept 19

1865 Lacustris Tuttell Ste Marie July 27

1865 Bracunii Morgan Sept 2. Clinton

1853. Melanocarpa Athens

1863 Ringwood

1862 Clinton

1844 Nuttallii Geyer

1844 I. Lacustris Geyer Selkirk. Catal.

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OFFICE

St. Louis Agricultural & Mechanical Association,

LINDELL HOTEL, No. 14,

Sept 4 1866

Mr. Dr. G. Engelman

Dear Sir:

You are hereby notified that the Board of Directors of this Association, have appointed you one of the Awarding Committee in Class H. No 1. Geological & Mineral Dept. at their Sixth Fair, commencing on the 1st day of October next.

Please inform the undersigned by letter, if it will be convenient to accept the appointment.

Respectfully Yours,

G. O. KALB,

Secretary.

If not answered within 10 days from date, it will be considered as a refusal.

1.3958
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13959

L. Cacaotis, very Insects are called Thus before the Discovery
Words were ~~Chocolate~~ Introduced; L. Cacaotis was for the first
time intelligibly ~~described~~ characterized:—

1753 ~~G. G. L.~~ = Gen. Manual 2d edit. but poor.

1767 G. G. 2 edit

Q. marroranpa and alba which externally resemble more the former than the latter, the proportion of the stalks and the caudicle is entirely that of ~~alba~~ the latter and not of the former. I have observed this fact in hybrids from Illinois as well as from Vermont.

three to four times as long. Q. densiflora of the section Andro, Gyne is similar in this respect to the first.

A few White Oaks resemble the Black Oaks in the proportion of these parts. These are Q. marroranpa and undulata * and especially Q. Robur of Europe. In this and in the Californian Q. Chrysolepis I find the caudicle nearly three times longer than the stalks; in both of them I also ~~find~~ notice the plumule unusually developed.

But in the majority of White Oaks the caudicle is shorter than the stalks of the cotyledons; I have examined the American Q. alba, stellata, Garryana, Douglasii, Breweri, Prinus, Mühlenbergii, prinoides, Michauxii, bicolor, dumosa, pungens *) and ~~the south~~ Q. occidentalis of south western Europe. It is very interesting to find that in the hybrids of

post note refers to *

* All the ~~other~~ Colorado forms of Q. undulata, which I have examined, those with large and deciduous leaves, ~~var~~ var. Gambelii, Gunnisoni, Jamesii, as well as the small and spiny-leaved form from the edge of the cañon of the Arkansas, which I had considered as identical with ~~the~~ Q. pungens, have short stalks, while the pale and usually persistent leaved forms from Arizona, the true Q. pungens of Liebmann, have the stalks ~~of the cotyledons~~ longer than the caudicle. Finding the proportions of these parts to be constant and as indicating specific difference, I am now inclined to consider Q. pungens, (including Q. grisea) as a distinct species, provided other characters can be found to confirm this view. In a few acorns of this form I have seen the cotyledons adhering together, but in the majority they were free.

By far the longest stalks or petioles, however, are found in Q. virens; in this species not only the cotyledons, as is well known, but also their stalks are coalescent, the caudicle itself is very short, only about one fourth or one fifth the length of the stalks, and the place where they separate from the caudicle is indicated by the very small and imperfect plumule, completely imbedded within the connate base of the stalks.

The acorns, as is well known, germinate in the ground,

Isoëtes melanopoda

E. Hall writes from Athens Ill. June 5th 1865

The season is very dry and Isoëtes in some localities has died as water does beginning of May. It is there much more developed than in the water. Spores all formed. 0.33–0.38 mm

In water I find it now in few localities only, in places 6 inches deep — with leaves 8–12 or 15 inches long, — with base of leaf as yet undeveloped

It does grow in deep water but forms a belt between the deeper water and the shallow banks of the lakes.

June 19th Season dry, a few light rains lately; all the Isoëtes now dry, as the water of the ponds recedes rapidly. Isoëtes on the driest ground is now withering and the mice are already engaged in digging out the "spores" [Queen: bulbs?] for food. All the localities of Isoëtes here are under water in spring, 1 inch or more.

A dead furrow in my meadow, left after sowing, was full of Isoëtes — none around. Water had been standing for a time in the furrow.

In the deepest places where Isoëtes grows the leaves grow 10–18 inches long, in shallower ones 5–10 inches. When the water falls the long leaves drop and float on water. The short are prostrate on the mud or soil, or are upheld by stouter grasses. In the deepest water the leaves are always submerged.

over

1396 B

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July 10th I have been out after Isoetes again.
all dead entirely — ponds all dried up for 2 weeks
Young plants do not bear spores the first year
Every thing dry here; rain much needed,

July — Spors ripe with me + the rudiment plants
" 27 Few Sporangia left — most of them rotting away.
all the fresh leaves bear male spores
Sept 10 Plant still vegetating — no trace of microspores
all leaves bear microspores — the former
must be preserved + the result — Sporangia
rotten off —

Cryptogamic observations

E Hall + Ctt Nov 16 1865

Second Crop of my Isoetes, when in water, is now
maturing good spores

Plants that come from the spores in July, are now
maturing spores, though quite small.

Clods turned up by the plow before the
rains of July have sometimes dozens of seedlings
on them, all with spores and apparently mature
2 weeks ago, when out of water. The leaves
are not readily killed by frost —

E Hall + Ctt. Sept 20. 1865

I have been looking after Isoetes melanopoda yesterday. Judge of
my surprise in finding it in the water 6 inches high just
as I find it in May. New plants entirely, the old leaves
and spores all rotted away. So put our wet season has
turned September into May.

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

139601A

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139604

St Louis Mar 24th 1865

Dr G. Englmann

Dear Sir

I. W. White I send you proof
to [illegible] and Correct and

139608

EDWOOD
Apothecaries &
S.W. CORNER
J.C. Wood, Olive St.

Morphological
~~Biological~~ Notes on Botrychium ~~Botrychium~~ ~~Botrychium~~ ~~Botrychium~~

HARVARD COLLEGE LIBRARY,

December, 1877.

It is proposed to issue by subscription a catalogue of scientific serial publications in all languages, which has been prepared by Mr. SAMUEL H. SCUDDER, Librarian of the American Academy of Arts and Sciences, and formerly librarian of the Boston Society of Natural History, and well known for his various scientific publications.

This work, which has double the extent of any existing list of the like kind, aims to include all society transactions and independent journals in every branch of natural, mathematical, and physical science, excepting only the applied sciences, — medicine, agriculture, technology, etc. The different institutions or periodicals are arranged under the towns in which they are established or published, and the towns follow an alphabetical order under their respective countries. Cross references, as the accompanying sample will show, are given wherever desirable.

Secretaries of learned bodies will find this work useful as a check list of their exchanges, and librarians can readily make use of it as a catalogue of their own scientific serials, either by suitable marginal marks or by extracting the separate numbers and pasting them upon cards for their slip-catalogue.

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Address,

12961

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Office of Wm. Brueggerhoff,
Wholesale Grocer.

SOLE AGENT,

Schlitz Milwaukee Beer.

Austin, Tex. den 10 Mai 1880

Herrn H. G. Engelmann
St. Louis

Geehrter Herr!

Zufolge Ihrer freundlichen Zuschrift sende Ihnen Muster zur Ansicht und Prüfung und bitte um Ihre baldige Antwort, ob Sie mir Ihre Ware zu den Preisen der Muster liefern können, und wie lange Zeit Sie nöthig haben, um Ihre Ware zu machen.

Ihre Klaue ist sehr schlecht, so dass ich nicht recht weiss, was Sie bestellen, und die Preise vermuthen muss.

Zu gefälligen Ihrer baldigen Antwort

Achtungsvoll Ergebenst

Chas Kuppertz

Muster 1 Stück, nämlich
Muster 2 Stück
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Muster 5 Stück

13962

/

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small type

Magnolia, Fagus and Nyssa, rarely on sandy soil, and never in the so called Pine-barrens. He describes the branching of the tree as singularly characteristic, the spray usually being flattened, somewhat like those of Cedrus. It probably extends through the lower parts of the South Eastern and Southern States, as it is again found in Mississippi (E. Hilgard). The tree grows up to 80 feet high; the bark of such old trees is compared by some to that of the maple, by others to a smoothish Oak bark.

40 P. Banksiana, Lamb. published 1803 in Lambert's first edition, ~~four~~ a year prior to Poiret's name of P. rupestris, which name is to be erroneously preferred by Parlatore. must give way to the former. ~~One of the pines or~~ Probably the only pine with erect or at least patulous cones. The small prickles of the very young cones soon disappear, so that the mature ones are unarmed. The base of the wing entirely covers the outer side of the seed, just as it does in P. rigida, so that ~~the cones~~ which I have not seen in any other pine to this extent. The cones ~~persist~~ are often serotinous and persist for a long time. The seeds seem to germinate most readily, just like those of P. taeda and in moist sandy soil ~~grow~~ in old fields and along rail roads young trees spring up abundantly. It makes a moderate sized Tree, but is perhaps never over 20 or 30 feet high and 10-12 or very rarely 18 (H. Gilman) inches in diameter. Very common in northern Michigan and Wisconsin it does not seem to extend much further westward, on the Saskatchawan it is replaced by P. contorta.

41 P. ovocarpa, Schiede. Most of the ducts are internal, occasionally a parenchymatous one was found in the leaves examined by me. Further investigation must show, whether this species may not more properly be referred to its Mexican neighbors of the Pseudo-Strobi group. Strengthening cells are abundant around the ~~ba~~ under the epidermis and also near the vessels.

42. P. australis, Michx. Male flowers 2½-3 inches long, the largest of any pine, of rose-purple colour; lowest pair of involucral bracts minute. On a very vigorous shoot I have seen

L. v. Schweinitz ' D. canutus Cayuga 1820 Ny. Catskill on first Sprouts
L. Vahl living Greenland L. echinospora var Ro. on Rivers + Lakes
of the coast
? (1812 ? T. Park L. echinospora ?) Coasts

1815 Th Nuttall L. riparia near Natchez. taken for canutus
1831 L. W Robbins ' L. riparia Upstate
1832 C. J. Moser L. Cayluxii in the Lehigh Co in the Barnhard (or Hills)
(in the Herbarii is now the Cayluxii also D. riparia

1834 Th Nuttall L. Nuttallii Oregon mention near Opava
1840 L. W Robbins L. Cayluxii Upstate
? 1840 L Riegel L. Hoodii Florida
1842 L Cayluxii L. Cayluxii Missouri
1843 E. Tuckerman L. canutus New Hampshire Echo Lake

" Ch Jeger L. Nuttallii Echo

1844 D Landsgren L. riparia Philadelphia
1844 - E. Tuckerman " " " Salmon
1845/848 E Tuckerman L. Tuckermanii Massachusetts Dr. J. W Robbins Braun's
Upstate

" " " L. echinospora Braunii "

1850 A W Chapman L. Hoodii var Chapmanii Fla

1853 E Hall L. melanopoda, Ill. "often mistaken for"

1856 G. Engelmann L. canutus Echo Lake

1856 G E " L. Echinosp. var Braunii Lake Sequoyah
1857 E D Eaton L. Cayluxii Conn.
1860 1859 Wm Boott L. echinosp. var macrostachya Mass. A W Chap Braunii
Vermont

1862 " L. " Braunii N Hampshire

" L. Lesquereuxii " " " Round Lake NY.

" Th C Porter L. Cayluxii var rubricollis Pennsylvania

" G. Vasey L. melanopoda, Clinton Iowa

1863 J. Macoun L. ech. Braunii West Canada
" E. Durand E. Englemanni New Jersey
1863 C M Canby L. sacharata Maryland
1864 L. W Robbins L. Cayluxii Mass
L. riparia Mass

C Frost " Conn.

J. Macoun " Canada West.

1865 Leidy & Porter L. canutus Alaska Sequoia, Southern

" Wm Boott L. Cayluxii Mass
" " L. Tuckermanii
1866 Ch Wright L. Eubanxii Cuba
" H Rolander L. pygmaeus Calif
" " L. Bolanderi "
" H Coan L. Cayluxii var rufescens Del
1867 Wm Boott L. canutus Fresh Pond Mass
" " L. echinosp. var Boottii Mass
1869 S. Watson " " Braunii Utah
" Wm Canby L. melanospora Georgia

13963

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The Acorns and their Germination

by Dr George Engelmann

The structure of the acorns and the germination of the oaks seemed to be so well known, that I did not pay much further attention to it, ~~though I had collected acorns and seedlings early, whenever an opportunity~~ until my interest was excited by the information that the germinating live oak developed little tubers, well known to the negro children and greedily eaten by them. The notes and the specimens obtained from my South Carolina correspondents, Messrs H. W. Ravenel, W. St. J. Mazyck, who was the first to notice this ~~fact~~, and Dr J. H. Mellichamp enabled me to examine (the germinating live oak) and to compare it with other oaks in this condition. I now studied the acorns, as many mature ones as I could ~~buy~~ find in my collection, and the oak seedlings, which I had as well as other seedling trees carefully collected whenever I could obtain them. The following are the results.

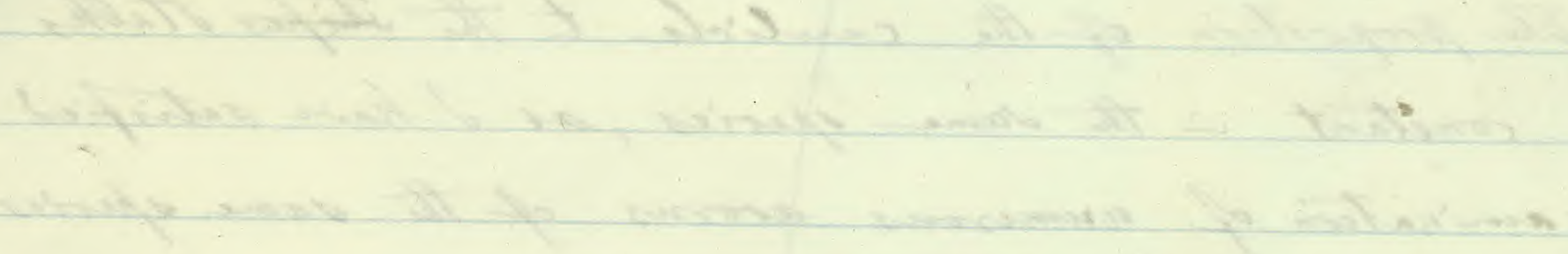
In the tip of each acorn we distinguish imbedded between the two large fleshy cotyledons first the little caulicle, and then at its upper end (towards the centre of the acorn) the two ~~stipes~~ stalks or petioles of these cotyledons, ~~and~~ between these the plumule is visible, more or less developed, usually only a truncate or slightly notched or emarginate knob. These parts together are in the different species and in different sized acorns usually from one to three lines long and one half to one line in diameter, in very small acorns sometimes smaller.

The proportion of the caulicle to the ~~stipes~~ stalks appears to be constant in the same species, as I have satisfied myself by examination of numerous acorns of the same species from widely separated localities.

In all the Black Oaks which I could study the caulicle is longer than the ~~stipes~~ stalks. Thus in Quercus nigra, imbricaria, pumila and Kelloggii I find it twice as long; in Q. coccinea and Tinctoria, rubra, ilicifolia and agrifolia it

13964

~~1871~~	~~H Gillam~~	~~I. ech. Bra~~	~~Kansas~~	V
"	C Hall	I Albatalis	Oregon	Mo. E
1872	"	I. melanopus	Texas	"
1873	I. O'Jans	I. echin Ark	Nova Scot	V
1873	C C Parry	I. Bolanderi	Wyoming	"
"	A W. Chapm	I. Eng var georgi	Georgia	"
1875	G. D Butler	I. melanopus	Fort Scott	"
"	"	I. Butleri	" "	"
1878	C G Pringle	I. ech. robusta	Vermt	"
1879.	M. Jones	I. Bolanderi	Utah.	"



Isoetes

I. Cubana Engl. n. sp		Oct. 1866	Chas. Wright.		1866
I. Caroliniana Li		Fresh Pond,	Cambridge Mass	Wm Booth	1867
		Echo Lake- Bancroft's	Mtns, N. Hamp	J. Carlton's Enumeration	1856 - 1873
		" Ox Bridge Mass.		J. W. Robbins	1845
		Sault de Ste Marie	Mich	Leidy & Porter	1865
		Catskill Mtns	Schweinitz	Schweinitz	?
I. pygmaea Engl.		Mono Pass, Cal		H. Schrader	1866
I. Tuckermani Braun		Massachusetts		Tuckerman Wm Booth	1848 1865
I. echinospora var Braunii		Lay. N. Y. Round Lake,		Lesquereux	1862
		Mass. Ox bridge		Robbins Tuckerman	1848 1864
		Vermont		A. W. Chapman	1859
		New Hampshire, White		J. E.	1856
		Lake Winnipesaukee		Wm Booth	1863
		Echo Lake		"	1862
		Canada Bed,	Manitou Lake	J. Macoun	1863
		Michigan	Detroit River	H. Gillman	1871
		Utah, Uintah Mtns		S. Watson	1869
		Nova Scotia,	J. D. James		1873
		Greenland,	Vahl		?
var robusta		Vermont,	Lake Champlain	G. J. Boyle	1878
var muricata		Mass.		Wm Booth	1862 1876
var Boothii		Mass		Wm Booth	1863
I. pleocoides Shutt.		Florida		Engl.	1842 ?
var Chapmanii		"		A. W. Chapman	1870
I. melanospora Engl		Georgia		Wm H. Canby	1869
I. Jacksonii Engl		Maryland		Wm H. Canby	1863
I. Bolanderi Engl		Calif.		Bolander	1866
		Wyoming		C. Parry	1873
		Utah		Jones	1879
I. riparia Eng		Pa & Del	Nuttall	Nuttall 1834 Darlington Isoetes 1842	1845 1844
		Mass & Conn	Gray	Robbins Isoetes 1862 1844 Canby in Canby	1864 1866
		Canada West	Cross Above.	Macoun	1864
I. Engelmanni Braun		Missouri			1842
		Pennsylv. etc	E. Tuckerman 1858 Moser 1832	Dept 1863 Canby	1866
		New England		Booth	1867

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small type

+ P. muricata, with which Parlatore unites it, is very different and belongs to the coast region.

13965

is the original P. contorta of Douglas (from the mouth of the Columbia River) and P. Bolanderi, Parlat (from Mendocino, California); it is a regular seaside tree, an excellent screen against the Pacific storms and their salt spray, just as P. Halepensis is on the Mediterranean; its leaves are often entirely destitute of ducts. The broader-leaved mountain form ~~is~~ has been distinguished as P. Murrayana, Murr. as Jeffrey's original specimens prove, which come from the Sierras; + this broad-leaved form formerly extends to Oregon and to the Rocky Mountains, while the forms of the coast and of the Rocky Mountains have very knobby, oblique and persistent cones (see pag.) those of the Sierras have occasionally more regular, less tuberculated, and readily opening and deciduous cones, without being otherwise distinguishable (C. S. Sargent). The wood of this species is white and soft, and the tree is therefore often called white pine or spruce-pine.

28. P. Sabiniana, Dougl. and P. Coulteri, Don (macrocarpa Lindl) have often been confounded, (can not be) but those that have been able to compare both growing; both have very large cones with spurred apophyses and large edible seeds, but the cones of Sabiniana are shorter, thicker, dark mahogany-brown, the seeds larger (9-12 lines long) almost cylindrical, with much shorter wings; those of P. Coulteri are more slender. of a paler leather colour, the seeds shorter, 6-8 lines long, and their wings longer. The foliage of P. Sabiniana makes a round-topped tree with spreading branches and lighter, looser, (17) more slender and lighter foliage on glaucous branchlets; P. Coulteri is a more conical tree with rigid branches and denser, coarser and darker foliage. The seeds of P. Sabiniana are or have been a most important article of subsistence for the Indians,

29. P. insignis, Dougl. distinguished by its fresh green foliage and closely and strongly serrulate leaves. Cones generally thick and very oblique with the scales of the outer side large, and thick and on the inner side flat smaller and; some cones are more regular, all the scales nearly equally flat. For the synonymy I refer to Flor. Calif. 2. 127, repeating here only that the